

REMARKS

The issues remaining in the Office Action mailed November 19, 2003, are the rejections under 35 U.S.C §112, 102 and 103. Reconsideration of these issues, in view of the following discussion, is respectfully requested.

Formal Issues

The Examiner's careful reading of the specification and claims is appreciated. A brief description of the drawings has been provided, as requested, and the Abstract has been amended as requested at page 3 of the Office Action.

Rejections Under 35 U.S.C §112

Claims 1, 2 and 12-34 have been rejected under 35 U.S.C §112, first paragraph. Reconsideration of this rejection is respectfully requested. It is argued, at page 2 of the Office Action, that there is no disclosure of how to use the invention as a catalyst or adsorbent. Applicants respectfully disagree with this analysis. It is believed evident from the specification, for example, at page 1, lines 20-26, that the materials of the invention are to be used as adsorbents and catalysts in a similar manner to those of the prior art. It is well known that a specification need not disclose, and preferably omits, that which is well known in the art. See, for example, *Hybritech v. Monoclonal Antibodies*, 802 F2d. 1367, 231 U.S.P.Q. 81 (Fed. Cir 1986). Withdrawal of the rejection is therefore respectfully requested.

Claims 1, 2 and 12-34 have also been rejected under 35 U.S.C §112, first paragraph, as failing to comply with the written description requirement. Reconsideration of this rejection is also respectfully requested. As noted at page 2 of the Office Action, the claims use the term "mineral oxide." It is noted, at page 2 of the Office Action, that if Applicants "mean to recite metal oxide instead of mineral oxide, they should do so." However, Applicants *do not* mean to recite "metal" oxides, although such are clearly encompassed within the scope of the present invention. Indeed, the invention clearly encompasses materials such as those disclosed at page 2, lines 20-25 of the specification. The term "mineral" is well known as a "native, inorganic or

fossilized organic substance having a definite chemical composition and formed by inorganic reactions." See Grant and Hackhs Chemical Dictionary, 5th Edition, 1987. It is well established that terms in claims should be given their full meaning, in the absence of evidence that Applicants intended something different, see *In re Marzocchi*, 439 F.2d 220, 169 USPQ 367 (CCPA 1971). It is not explained at page 2, of the Office Action, why the Examiner believes Applicants do not intend the full scope of the meaning of the term as defined in their specification. Thus, it is submitted that the specification provides complete written description for the claims, and withdrawal of this rejection is also respectfully requested.

Claims 1, 2 and 12-34 have also been rejected under 35 U.S.C §112, second paragraph. Reconsideration of this rejection is also respectfully requested.

As noted above, claim 1 is clear as to the intended scope of "mineral" oxide; any mineral M capable of forming M-O-M' as described in the claims is clearly intended. Thus, it is submitted that the claim is sufficiently definite for one of ordinary skill in the art to practice the invention. Moreover, the query in the sentence bridging pages 2 and 3 of the Office Action is not fully understood. It is believed evident that the sulfur and phosphorous bonded together by a hydrocarbon chain are bonded to the mineral oxide through oxygen atoms connected to phosphorous.

The Examiner's remaining comments at page 3 of the Office Action are appreciated, and appropriate changes have been made to the claims. It is noted that the changes made to the response to the comments at page 3 of the Office Action do not change scope of the claims, either literally or for purposes of the doctrine of equivalents.

Finally, with respect to claim 17, it is submitted that the variable *n* is defined, inasmuch as values are given for *m*, *p*, and *q*, and $m+n+p+q$ is equal to 3. Thus, the value of *n* can clearly be determined. With respect to the query at page 3 of the Office Action that it is not clear how to obtain metal oxides or mineral oxides from metal halides or alkoxides, it is believed that this process is described in sufficient detail, for example, at page 4 of the specification, and in the examples.

Withdrawal of this rejection is therefore respectfully requested.

Rejection Under 35 U.S.C §102

Claims 1, 2, 12-17, 19, 21, 24, 30 and 32 have been rejected under 35 U.S.C §102(b) over Dines, et al. Moreover, claims 1, 2 and 12-16 have been rejected under 35 U.S.C §102(b) over Alberti, et al. and claims 1, 2, 12-17, 27, 28 and 34 have also been rejected under 35 U.S.C §102(b) over FR '971 (Corriu). Reconsideration of each of these rejections is respectfully requested.

At page 4 of the Office Action, it is argued that Dines, et al. discloses the invention at page 93, in table 1. The Office Action points to the second column of the table, the 3rd and 5th compounds, as well as the 3rd column, compound 7. Moreover, the Office Action points to page 296, table 3 of Alberti, highlighting the 7th and 8th compounds in the right hand column. In fact, none of these disclosures represent materials within the present invention. Both Dines and Alberti disclose phosphate or phosphonate compounds in crystallized form, that is, compounds having clearly defined structural formulae $\text{Zr}(\text{O}_3\text{PCH}_2\text{SO}_3\text{H})_2$, $\text{Zr}(\text{O}_3\text{PCH}_2\text{CH}_2\text{SH})_2$ or $\text{Zr}(\text{O}_3\text{P}(\text{CH}_2)_3\text{SO}_3\text{H})_2$. It is evident that these crystalline materials have the structure which does *not* contain M-O-M', but only M-M'. For example, see the representation of the "simplified structure' in figure 1 in the left-hand column at page 93 of Dines, wherein zirconium, represented by a circle with a dot therein, is not bonded through an oxygen atom to another zirconium atom. Similarly, figures 1-3 of Alberti, found at pages 293 and 294 of the article, clearly show through computer representations or schematic drawings that zirconium, represented by a large dark circle, does not participate in any zirconium-oxygen-zirconium bonding structure, instead being only linked through oxygen to phosphorous atoms.

Moreover, the phosphonates of Corriu also appear to be of this structure, wherein M atoms are not bonded thorough oxygen to other M atoms. For example, note formula I at page 1, line 20 of Corriu, in which M is a tetravalent element from groups IVa or IVb of the periodic table. Similar compounds are disclosed, for example, as the first two compounds of table 3 of Alberti, et al., and thus clearly suggests that materials of Corriu are also compounds lacking M-O-M' groups.

It is thus respectfully submitted that none of the above discussed references disclose, much less suggest, a compound within the scope of the present claims, containing M-O-M'

groups. Withdrawal of these rejections is therefore respectfully requested.

Claims 1, 2, 12-17, 19, 21, 27, 30 and 32 have been rejected under 35 U.S.C §102(b) over Wieserman, et al. '429. Reconsideration of this rejection is also respectfully requested.

Wieserman discloses a material comprising a "substantially monomolecular layer of one or more phosphorous-containing organic acid molecules chemically bonded to the surface of a metal oxide/hydroxide particle," see column 3, lines 21-24 and 52-62. Patentees disclose that this material is obtained by grafting with a phosphonic or phosphinic acid. See, for example, column 7, lines 15-21. The result, as described at column 7, lines 41-48, and in figure 2, is a construct where the phosphorous containing acid group (-Y) is bonded to the metal oxide/hydroxide particle surface, and, thus, all M-O-P bonds are localized at the surface of the particle. Any M-O-M bonds which exist would be distributed throughout the particle bulk, as evidenced from the above-noted portion of the reference.

Thus, as set forth in the present specification wherein Wieserman is discussed, e.g., at page 1, lines 18-30 and at page 4, lines 24-29, the use of gel formation to produce the materials herein results in M-O-P and M-O-M' being distributed at the surface *and* through the interior of the final particle. Thus, the structure disclosed in Wieserman accordingly cannot anticipate the presently claimed materials, which are defined by their process of preparation (gel formation) and thus, inherently, have a distribution of groups as discussed.

As further evidence of Wieserman's failure to disclose a material such as the presently claimed one, produced by gel formation, attention is directed to the attached declaration under 37 C.F.R. 1.132, where it is shown that the Wieserman product is heterogeneous, as described in Patentees' specification, and not a homogenous product as claimed herein. Withdrawal of this rejection is therefore also respectfully requested.

Claims 1, 2, 12-17, 19, 21, 22, 30 and 32 have been rejected under 35 U.S.C §102(b) over Calhoun '233. Reconsideration of this rejection is also respectfully requested. Calhoun describes metallic salts of an acid containing phosphorous atom. As with Corriu, Alberti and Dines, Patentees' fail to disclose a material having M-O-M groups. It is evident from formula I and II, cited in the Office Action at page 4, that Patentees' compounds do not contain the "polyvalent metal", disclosed at line 30, bonded through oxygen to another polyvalent metal. Withdrawal of

this rejection is also therefore respectfully requested.

In conclusion, it is submitted that none of the cited references disclose a material within the scope of the present claims and, thus, do not anticipate same. Withdrawal of all the rejections under 35 U.S.C §102 is respectfully requested.

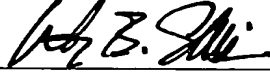
Rejections Under 35 U.S.C §103

Finally, claims 1, 2 and 12-34 have been rejected under 35 U.S.C §103 over each of Wieserman, Calhoun or Dines. The §103 rejection is made in order to attempt to reach the preferred features of these claims. However, as discussed above, none of these references whether singly or in combination, teaches the provision of material, e.g., produced through gel formation, having the structure claimed. Thus, it is submitted that, in the absence of motivation to modify the claims so as to produce a material such as that herein, this rejection should also be withdrawn. The same is respectfully requested.

The claims of the application are submitted to be in condition for allowance. However, if the Examiner has any questions or comments, he is cordially invited to telephone the undersigned at the number below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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